

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference B1616-03/PCT	FOR FURTHER ACTION  See Form PCT/IPEA416	
International application No. PCT/SK2004/000018	International filing date (day/month/year) 23.12.2004	Priority date (day/month/year) 23.12.2003
International Patent Classification (IPC) or national classification and IPC C07D277/72		
Applicant DUSLO A.S. et al.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> <i>(sent to the applicant and to the International Bureau) a total of sheets, as follows:</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> <i>(sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</i></p> <p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>		
Date of submission of the demand 22.07.2005	Date of completion of this report 02.09.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Usuelli, A  Telephone No. +49 89 2399-7366	

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/SK2004/000018

IAP20 Rec'd PCT/PTO 16 MAY 2006

**Box No. I Basis of the report**

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements\* of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

**Description, Pages**

1-11 as originally filed

**Claims, Numbers**

1-9 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
- 3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
- 4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-9
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Re Item V**

**1- Reference is made to the following documents:**

- d1: US-A-4 371 698 (ALICOT ET AL) 1 February 1983 (1983-02-01)
- d2: US-A-4 647 669 (ALICOT ET AL) 3 March 1987 (1987-03-03)
- d3: EP-A-0 475 226 (AKZO N.V; AKZO NOBEL N.V) 18 March 1992 (1992-03-18)

**2- Novelty**

Present process appears to differ from the process of d1 and d2 mainly on account of the step d). The process disclosed in d3 differs from the present process in that the reaction of aniline, carbon disulphide and sulphur is discontinued before the reaction equilibrium is reached. Furthermore d3 does not disclose a process comprising to present steps f) and g).

Accordingly, the requirements of Art. 33.2 PCT are met.

**3- Inventive step**

3.1- The applicant has set himself the task of providing a process for purifying the 2-mercaptobenzothiazole obtained by a reaction of aniline with CS<sub>2</sub> and sulphur. D1 to d3 disclose processes for the preparation and purification of the 2-mercaptobenzothiazole. D1 is regarded as the closest prior art.

The technical problem can be formulated as the provision of an alternative process for purifying the 2-mercaptobenzothiazole.

3.2- The processes according to d1 and d2 do not include a step wherein the liquid phase from crystallization of 2-mercaptobenzothiazole is reintroduced into the reactor for preparation of the raw product.

In d3, the mother liquor obtained after the filtration for separating the 2-mercaptobenzothiazole is directly recycled in the reactor for preparing the raw materials. However, the process according to d3 differs from the process of the present invention and from the processes of d1 and d2 in a certain number of features. As indicated above, in d3 the reaction of aniline, carbon disulphide and sulphur is discontinued before the reaction equilibrium is reached. This is achieved by quenching the reaction by addition of CS<sub>2</sub> which is then removed by distillation from the mother liquor obtained after the filtration for

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separating 2-mercaptobenzothiazole (cf. page 4, lines 19-20). Hence, the step of recycling of the mother liquor appears to be part of a specific process characterized by procedures which are not disclosed in the processes according to the other documents.

For this reason it appears that the skilled person would not readily combine the teaching of d3 with the teaching of d1 or d2.

Hence, the requirements of Art. 33.3 are met.